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ABSTRACT

This study investigated the role that emotional factors play in learning about sexual health and in adopting sexually healthy behaviors. Learning about health and adopting healthy behaviors hinges on two variables: the desire to avoid illness and a belief that one can avoid threats to health through personal action. This paper reports on individual differences which influence learning about sexual health. Erotophobia, or a negative affective response to sexuality, has been shown to inhibit sexual health, including birth control and sexually transmitted disease (STD) preventive techniques. An experimental-control group design was used to test the effect of erotophobia both on learning about STDs and subsequent perceptions of vulnerability to STDs. College students who were high in erotophobia gained less information and perceived themselves to be less vulnerable to STDs at posttest than did subjects low in erotophobia. According to these findings, it is vital for educators to gauge the emotional reactions of students to sexual health education prior to instruction to avoid increasing denial of sexual health risk. Sex health education, like all educational efforts, needs to be targeted to specific audiences. (LL)

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Affective Factors Which Influence Learning about Sexually Transmitted Diseases

by

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Abstract

This paper reports on individual differences which influence learning about sexual health. Erotophobia, or a negative affective responses to sexuality, has been shown to inhibit sexual health, including birth control and STD preventive techniques. An experimental-control group design was used to test the effect of erotophobia both on learning about STDs and subsequent perceptions of vulnerability to STDs. College students who were high in erotophobia gained less information and perceived themselves to be less vulnerable to STDs at posttest than did subjects low in erotophobia. Based on these findings, it is vital for educators to gauge the emotional reactions of students to sexual health education prior to instruction to avoid increasing denial of sexual health risk paradoxically. Sexual health education, like all educational efforts, needs to be targeted to specific audiences.

Health education has been hailed as a primary means of promoting positive health behaviors. However, health behavior has multiple and complex determinants (Becker, 1974). Diverse demographic, social and psychological variables may limit the impact of traditional instruction on health behaviors. Health education research attempts to bridge the gap between theory and practice to develop and implement alternative health interventions. In particular, health education research attempts to explain and predict acceptance of health behavior recommendations (Janz & Becker, 1984).

In keeping with that goal, this study investigated the role that emotional factors play in learning about sexual health and in adopting sexual health behaviors. Sexually transmitted diseases (STDs), including AIDS, are epidemic among adolescents and young adults (CDC, 1990) and their social, psychological, physical and economic costs are staggering (O'Reilly & Aral, 1985). Yet, research has shown that educational approaches such as lecture and rote learning are inadequate to change STD risk behaviors (Arafat & Allen, 1985; Baldwin & Baldwin, 1988a, 1988b; Balwin, Whitely & Baldwin, 1990). People continue to act in ways that are unhealthy, often despite adequate information about risk, primarily because change is difficult (Ostrow, 1990). Clearly, factors other than information induce the adoption of health behavior (Catania, Kegeles & Coates, 1990; Kegeles, Adler & Irwin, 1988).

The decision to both learn about health and adopt healthy behaviors hinges on two variables: the desire to avoid illness;

and, a belief that one can avoid threats to health through personal action (Janz & Becker, 1984). This implies that a person must feel threatened by the risk of illness. The likelihood of changing health behavior is lowered when an individual perceives that personal vulnerability to negative health events is low. One's perception of little personal vulnerability may not be based on objective evidence; factors other than information may color perceptions of vulnerability. Thus, even if a person wants to avoid STDs, that person is unlikely to adopt STD preventive behaviors if she or he perceives little personal susceptible to STDs.

Perception of susceptibility or vulnerability to health outcomes is a crucial component of the health adoption process as conceptualized within the Health Belief Model (Rosenstock, 1974). Both affective and cognitive mechanisms have been proposed to explain perceptions of personal vulnerability (Weinstein, 1980; 1983; 1984).

The topic of STDs is one in which affective explanations and cognitive explanations of perceived vulnerability overlap. Some theorists propose that affective variables have a stronger influence than information on perceptions of vulnerability when certain personally salient outcomes are considered. For example, Weinstein (1980) reported that people are more likely to see themselves as invulnerable to events judged as "controllable" and those to which a stereotype is readily available than to events

seen as uncontrollable. STDs are know to be entirely preventable by behavioral "control," and often elicit strong negative stereotypes in people's thinking.

Many people have a strong affective reaction to sexuality, labeled "erotophobia," which in the past has been shown to influence sexual health care (Fisher, Kelley & Byrne 1988). Adolescents and women are more likely to show erotophobic responses than are older adults and men. For some, erotophobia may be a central affective variable in sexual behavior and may control reactions to sexual information.

We investigated the role of erotophobia in the formation of perceptions of invulnerability to sexually transmitted diseases (STDs). In previous studies, we had learned that college aged people experience little sense of personal vulnerability to negative events, including the threat of STDs and AIDS, despite self-reported risky behavior (Albrecht, Schmidt, McKirnan and Flay, 1990). However, we also found that adolescents often were woefully misinformed about STDs in general and expressed little interest in learning about STDs. Our previous surveys could not determine whether informational or affective variables were responsible for the disinterest and perceptions of invulnerability observed.

We examined the influence of erotophobia on subjects' ability to learn about two health topics, sexually transmitted diseases and skin cancer. Although both are preventable, only

STDs are generally associated with negative stereotypes. We generally hypothesized that attitudinal erotophobia would affect both the learning of new sexual material, and subsequent perceptions of vulnerability to STDs. We further hypothesized that learning about non-sexual material would not be influenced by "erotophobia." Erotophobia was also generally expected to lead to strong perceptions of unique invulnerability to STDs at follow-up but not expected to influence perceived invulnerability to skin cancer. Support for these hypotheses would illustrate the operation of a specific affective variable in the perception of health risk.

Method

We tested whether emotional factors effect subsequent perceptions of vulnerability to negative health outcomes and subsequent learning of health material by pairing a relatively "hot" health topic with a relatively neutral health topic while providing equivalent information about each topic. The study used a pretest-posttest experimental-control group design and presented educational interventions about both STDs and skin cancer.

Subjects

Only 90 subjects' (49 experimental, 41 control) could be used for analyses. The modal age was 21 years old. Fifty-one percent of the sample was female, 49 percent male. The ethnic composition of the sample was 48% Caucasian, 18% African

American, 18% Asian, 14% Hispanic and 2% Middle Eastern. This breakdown is reflective of the general undergraduate population at UIC. Eighty-five percent of the sample was unmarried, 8% "lived together" with a sexual partner and 7% were married. Seventy-six percent of single students were dating. Of the students who were dating, 70% of them were in "exclusive" or steady relationships. Seventy-eight percent of subjects lived at home with their families.

Of the ninety subjects with complete data, 80% of them reported that they had sexual intercourse in the past, with 68% of the sexually experienced subjects reporting a current sexual relationship.

The mean level of erotophobia was 56.50. It is interesting to note that the mean level of erotophobia in this sample is one standard deviation higher than the mean level reported by Fisher et al (1988), despite recruitment procedures to stratify the sample between high and low erotophobics. This may reflect a socially conservative population and is consistent with pilot studies within the UIC population. Sexual conservatism may also be reflected in the finding that no females reported concurrent multiple sexual relationships, which again may reflect conservative behavior, or at least, conservative reporting of behavior.

Procedures

Five hundred twenty-five undergraduate subjects were screened for level of erotophobia with the Sexual Opinion Survey (Fisher, Byrne, White & Kelley, 1988) to assure sufficient recruitment of erotophobic subjects. Potential subjects were divided into high vs. low erotophobic groups based on their responses and recruited into an experiment titled "Reasoning about Health and Health Events" rather than any sexually-explicit experiment title, to avoid any self-selection bias of erotophobic people. High and low scorers were randomly divided among experimental and control group recruitment rosters. Segregated sessions were held for men and women in order to minimize stress and potential embarrassment associated with the sexual health topic (Herold, 1981).

All pretesting was completed in the first session. In accordance with the IRB approved consent procedures, experimental subjects were informed that in the next session, they would be assisting the investigators evaluate the efficacy of two different health education videotapes, one instructing about STDs and one about skin cancer. Subjects who did not wish to return for this procedure were instructed to telephone the experimenter privately and were allowed to drop out of the study. Only 5% of subjects did not complete the second session. Post-testing was done one week after the films were viewed. Control subjects

completed the same questionnaires at pretest and posttest but did not receive any instruction.

Experimental subjects viewed the two instructional videotapes and listened to two brief verbal presentations that complemented each video. The order of presentation of the instructional material was fixed. The skin cancer video tape (Mermelstein and Riesenberg, 1991) was presented first in order to minimize possible contamination by strong emotional reactions to sexual material. Previous research has shown that strong emotional reactions to sexual information can interfere with attention to information presented within the same instructional period. After the first video, the experimenter presented verbally reiterative and supplemental information about skin cancer.

A video, entitled "Sexually Transmitted Diseases (1990), which was professionally produced for Planned Parenthood Association was presented next. The experimenter again presented reiterative and supplemental material regarding sexually transmitted diseases, base rates of STDs on campus (20-25% of female visits to the University Health Service), and specific prophylactic information following the video. Information provided within the verbal lecture or the film directly corresponded to knowledge assessment items. Control subjects did not attend any informational sessions.

Posttest questionnaires were administered to both the experimental and control group in the third week. Debriefing was provided to subjects at this time.

Measures

Socially desirable responding was measured as a co-factor (Palhaus, 1984). Sexual behaviors were assessed by a series of self-report items which had been pilot tested with college-aged subjects. Perceived vulnerability to skin cancer and STDs was measured with a ten point multiple choice format previously pilot tested. The 10-choice format allowed for likelihood judgments of events with very low incidence, such as AIDS in the college student population, that are not easily generated by subjects in a fill-in-the-blank format.

Knowledge of sexually transmitted diseases was measured by a series of 10 true-false questions adapted from our own previous research and from materials supplied by the Planned Parenthood Association of Chicago (Garfinkel, 1991). The correct content of each item was provided directly and specifically within the STD instructional materials discussed above. Experimental and control subjects did not significantly different from each other on pretest of knowledge items ($M = 4.01$).

The frequency of correct responses to the STD knowledge items on pretest are shown in Table 1. As can be seen, several of these items were answered incorrectly by the majority of subjects. The only item correctly answered by most students

concerned condom use. The pattern of results to these questions on pretest indicated that college aged subjects lacked basic knowledge of sexually transmitted diseases, their transmission, and prevention.

Table 1: STD Basic Knowledge Items Used in Analyses and Percentage of Correct Responses on Pretest

	Correct	Incorrect
Using condoms each time I have sexual intercourse would help prevent STDs.	83%	17%
Sexually transmitted diseases don't cause long-term health problems.	30%	70%
If I have sex with only a steady partner, I cannot catch a sexually transmitted disease.	46%	54%
It doesn't matter if I get a sexually transmitted disease because I can be treated with antibiotics easily.	26%	74%
Syphilis and gonorrhea are no longer common health concerns.	51%	49%
Chlamydia is not considered a sexually transmitted disease.	27%	73%

Results

Pretest Measures

Preliminary analyses showed that at baseline the experimental and control groups were equivalent in terms of mean levels of erotophobia, social desirability, STD and skin cancer information, and level of perceived invulnerability to STDs, skin cancer, and AIDS (All t-tests $p > .20$). Groups were also equivalent in frequency of sexual intercourse, birth control use, condom use, sexual history and alcohol use (All chi-square analyses $p > .2$).

Table 2: Mean Responses and Standard Deviations on Pretest of Key Measures for Experimental and Control Groups

	Experimental		Control	
Variable	**X**	**(STD)**	**X**	**(STD)**
Sexual Opinion Survey (SOS)	55.30	(12.5)	56.50	(9.5)
Self-Deception	9.45	(1.5)	9.95	(1.4)
Impression Management	9.33	(1.3)	9.66	(1.3)
Skin Cancer Knowledge	4.79	(2.7)	6.20	(2.6)
STD Knowledge	3.89	(1.4)	4.04	(1.5)
Skin Cancer Invulnerability	1.00	(1.8)	1.10	(2.1)
STD Invulnerability	3.22	(1.9)	2.60	(2.5)

Note: All t-tests are ns.

The average pretest STD knowledge level of both the experimental and control group represented a low level of STD knowledge. On average subjects answered only 75% of the questions correctly, suggesting that subjects lacked basic knowledge of STDs. Internal consistency of the

scale was high (alpha = .85). The scale appeared to have enough range to capture knowledge gain within the sample from pretest to posttest.

Frequencies of perception of personal vulnerability and perceived "average" vulnerability to STDs and skin cancer were equal across groups at baseline.

Table 3: Perceived Vulnerability to Negative Events for Self and "Average" College Students (n = 90)

	Personal Chances of:	Others' Chances of:
Skin Cancer	**Percent**	**Percent**
1:1,000,000	27.8	4.4
1:100,000	22.2	21.1
1:10,000	20.0	18.9
1:1,000	21.1	30.0
1:100	5.6	17.8
1:50	3.3	6.7
1:10	---	---
1:5	---	---
1:2	---	---
1:1	---	---

	Personal Chances of:	Others' Chances of:
STDs	**Percent**	**Percent**
1:1,000,000	37.8	7.8
1:100,000	25.6	10.0
1:10,000	10.0	21.1
1:1,000	18.9	13.3
1:100	6.7	21.1
1:50	1.1	11.1
1:10	---	13.3
1:5	---	2.2
1:2	---	---
1:1	---	---

We hypothesized that students with higher levels of erotophobia would show the least perceived vulnerability to STDs. Regression analysis of the predictive effect of erotophobia on STD invulnerability for all subjects was significant, $F(1,178) = 77.21$, $p < .001$, $R^2 = .302$.

An interaction between erotophobia and sexual frequency on judgments of unique invulnerability was also predicted. Regression analyses of sexual frequency, erotophobia and the interaction of sexual frequency by erotophobia was significant for the full model, $F(3,86) = 4.71$, $p < .01$, with 24% of the variance explained. However, analysis of the hierarchic regression model showed that erotophobia (beta = .138) alone was significantly predictive of STD invulnerability. The prediction that the interaction between frequency of sexual intercourse and level of erotophobia would lead to higher levels of perceived STD invulnerability was not supported.

Tests of Change Following Information

Perceptions of Vulnerability

If people did not think that they were vulnerable to negative health outcomes due to ignorance of risk, then information would lead to revised, more realistic perceptions of personal vulnerability. Thus, it was expected that after receiving information about both STD and skin cancer, subjects would show increased personal vulnerability to the corresponding negative events, i.e., skin cancer and STDs. At Time One, both the experimental group and control group were equal on measures of perceived invulnerability to skin cancer ($t(89) = -.46$,

ns) and STDs (t(89) = 1.31, ns) as well as AIDS (t(89) = .33, ns). However, at follow-up, correlated t-tests (pre-post differences) for both skin cancer invulnerability and STD invulnerability for both the experimental and control groups were not significant, showing no change in invulnerability from Time 1 to Time 2. Thus, the hypothesis that information alone could change perceptions of vulnerability was not supported for either health domain.

Table 4 : Mean Unique Invulnerability of Experimental and Control Groups at Pretest and Posttest

Skin Cancer Invulnerability	**Pretest** Mean	SD	**Posttest** Mean	SD
Experimental	.87	1.8	.91	1.3
Control	1.07	2.1	1.14	2.0
STD Invulnerability				
Experimental	3.22	1.9	3.44	2.4
Control	2.58	2.6	2.61	2.3

Knowledge

Further, it was expected that students would show increased knowledge after informational presentations. T-tests between the experimental and control groups on post-test differences on skin cancer knowledge showed that the experimental group had significant skin cancer knowledge gain, $t(88) = 3.58$, $p < .001$. There was also a small but significant corresponding increase in STD knowledge over time. This was contrary to expectations; erotophobia was hypothesized to interfere with learning about STDs.

Table 5 : Average Knowledge Scores of Experimental and Control Groups at Pretest and Posttest

Group	Pretest		Posttest	
Skin Cancer*	Mean	SD	Mean	SD
Experimental	4.79	2.7	11.00	2.1
Control	6.26	2.2	6.95	2.8
STD Knowledge**				
Experimental	3.89	1.3	4.59	1.6
Control	4.04	1.2	3.82	1.7

* $F(3,176) = 53.04$, $p < .001$, $R^2 = .47$
** $t(88) = 2.40$, $p < .01$

The Interaction of Affect and Information on Learning and Perceptions of Vulnerability

Based on previous studies, an interaction of erotophobia with STD information on STD knowledge but not skin cancer knowledge was predicted. A two factor (Erotophobia x Group) repeated measures analysis of variance was done. The overall model was significant, $F(3,94) = 5.87$, $p < .001$. There was a significant main effect of erotophobia ($F(1,96) = 4.55$, $p < .03$) between subjects, and a significant main effect of time ($F(1,86) = 5.66$, $p < .01$ within subjects. The two way interaction of time by erotophobia ($F(1,86) = 4.78$, $p < .03$) was statistically significant, suggesting differential changes in STD knowledge from pretest to posttest by level of erotophobia. As can be seen in Table 6, experimental subjects low in erotophobia showed increased STD knowledge at posttest while

experimental subjects high in erotophobia did not show any significant changes in knowledge scores.

Table 6: Mean STD Knowledge on Pretest and Posttest for Experimental and Control Subjects High and Low on Sexual Opinion Survey (SOS)

	Experimental		Control	
	Pre	Post*	Pre	Post**
Low SOS	3.71 (1.3)	5.11* (.99)	4.26 (1.1)	4.04** (1.4)
High SOS	4.14 (1.5)	3.90* (1.4)	3.72 (1.6)	3.55** (1.7)

(Standard Deviations)

* $t(45) = 2.91$, $p < .001$
** $t(45) = .145$, n.s.

Within the experimental group, a t-test between subjects high and low in erotophobia showed differential STD knowledge levels at posttest ($t = 2.91$, $p < .001$). For subjects low in erotophobia, average STD knowledge score was 5.10. For subjects high in erotophobia, average STD knowledge score was 3.90. There was no difference seen within the control group at posttest.

Further analyses showed that, as expected, erotophobia did not have a significant effect on skin cancer knowledge for either the experimental or control groups. Both high and low erotophobia experimental subjects showed significant skin cancer knowledge gain from pretest to post-test. A T-test indicated that skin cancer

knowledge gain scores did not vary among high and low erotophobic subjects ($t(45) = .145$, ns).

Given the main effect of erotophobia on perceptions of unique invulnerability, and the finding that erotophobic individuals did not appear to learn when provided with STD information, it was predicted that both erotophobia and knowledge interact in the formation of perceptions of invulnerability. If perceptions of invulnerability reflect denial, then providing information about objective risk would be stressful, and would lead to greater denial of personal risk. On posttest, experimental subjects high in erotophobia showed significantly higher invulnerability than subjects low in erotophobia.

A repeated measures ANOVA was done. For experimental subjects, the interaction of information with erotophobia predicted changed in STD invulnerability from Time I to Time 2. Experimental subjects low in erotophobia did not show any significant change in perceived unique invulnerability from Time 1 to Time 2. Experimental subjects high in erotophobia continued to rate themselves as having very little risk while judging others at very high risk. This then increased unique invulnerability. Subjects low in erotophobia showed more accurate judgments for both themselves and others, yet retained a mild gap between themselves and others. In addition, a T-test of STD invulnerability ratings of high and low erotophobic experimental subjects at post-test was significant, $t(88) = -5.76$, $p < .001$.

Table 7: Mean Post-test STD Invulnerability Scores for High and Low Erotophobia Subjects

Group	Low Erotophobia		High Erotophobia	
STD Invulnerability	Mean	SD	Mean	SD
Experimental	2.10*	1.6	5.23*	1.9
Control	1.82	2.0	3.57	2.4

* $p < .001$

Discussion

One of the major questions of this study was the role of affect in learning about health topics. We tested this by pairing a relatively affectively neutral health topic, skin cancer, with an emotionally "hot" topic, STDs. People are shown to vary in their affective reactions to sexuality, with some people showing "erotophobia." We found that our intervention was successful in changing basic knowledge of skin cancer risk and prevention for all subjects, regardless of their affective reactions to sexuality. In contrast, people higher in erotophobia showed less STD information gain than did people lower in erotophobia.

While this finding might be interpreted as a psychologically defensive phenomenon, with erotophobic subjects "tuning out" sexual health material in order to reduce anxiety (Janis and Mann, 1977), there may be another explanation for erotophobics' inattention to sexual material. Simply, people who do not see themselves as being at risk will not seek out information or will not pay attention to risk

communications (Kunreuther, 1976), not to avoid anxiety but because they see no personal relevance (Jemmot, Ditto, & Croyle, 1986) in the material. However, the contrast in knowledge gain between the relatively neutral topic of skin cancer for all subjects and the differential learning of STD facts among subjects high and low in erotophobia supports the notion that affect interferes in the learning of affectively-charged health topics.

In addition to coloring sexual health learning, affective variables may influence the health behavior adoption process, particularly the formation of perceptions of vulnerability. People who do not see themselves as vulnerable to a health threat are less likely to adopt health behaviors. We found that erotophobic subjects judged themselves as more uniquely invulnerable to STDs than did subjects who did not respond in an erotophobic manner.

These judgments of unique invulnerability may serve an "ego-defensive" function. The blanket provision of information about the specific and possibly threatening consequences of sexuality to a person who responds with negative affective reactions to sexuality might frighten rather than reassure. This might lead to even stronger denial of risk as the person attempts to cope with the negative affect. We found that the denial of personal risk increased when threatening information was provided to people who reported negative affective responses to sexuality.

The paradoxical effect of STD information on people with high erotophobia is striking. For these erotophobic people, sexual

information increased perceptions of invulnerability. The more invulnerable a person feels, the less likely he or she is to do anything to change current behavior. This finding would speak against the wholesale application of educational programs rather than individualized instruction targeted to specific audience.

Because education may still be the first line of defense in preventive health efforts, it is important to be aware that different people may have different reactions to health information. Health educators may want to screen for level of erotophobia in order to customize sexual health education efforts. Students who appear to have a negative sexual response to sexuality, which can be a function of age and gender, should be provided with information in a emotionally comfortable manner. For these students, individualized or computer assisted instruction rather than group instruction, might be helpful to increase knowledge and increase the probability of adopting healthy sexual behaviors.

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